APPENDIX A

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FIG. 7a depicts a cut-away side view of the bed rest pad of the invention with a heating unit.

FIG. 7b depicts a detail of a perspective view of the bed rest pad showing the transfer tubes.

DETAILED DESCRIPTION OF THE INVENTION

One preferred embodiment of the invention is intended to support the pelvis and thighs. For the purposes of describing this invention, the pelvis includes the hip bone, the sacrum and the coccyx bones, and the head of the upper femur which fits into the acetabulum of the hip bone. The hip bone itself includes the ilium, the pubis, and the ischium bones.

A perspective view of the bed rest pad of this embodiment of invention is depicted in FIG. 1a. The bed rest pad 1, being generally dimensioned to fit underneath a patient's buttocks and upper thighs, has disposed crosswise within it a plurality of fluid filled channels 2. On one side of the bed rest pad 1 the channels 2 are closed off, while on the other side the channels 2 are open. In a preferred embodiment of the bed rest pad 1, a side view of which is shown in FIG. 1b, the bed rest pad 1 is thicker near one end to accommodate raising the patient's thighs above the bed surface when the patient is in a supine position without constricting arterial or venous flow. The bed rest pad 1 itself includes a flexible cover 4 enclosing a semi-compressible core 5, as shown in FIG. 2c. The core material should be soft and flexible, but non-crumbly, so that the bed rest unit 1 can contour to both a mattress surface and a patient's figure when a patient is resting upon it. One preferred material for the semi-

compressible core 5 is closed-cell foam rubber. The cover can be manufactured from any flexible material, such as cloth, synthetic fabric, or plastic. In a preferred embodiment, the cover is a water-proof soft cotton fabric. The upper surface 7 of the cover 4 can also be embedded with a plurality of grooves 8 that extend laterally across the width of the bed rest pad 1 that serve to help prevent a patient from sliding off of the bed rest pad 1. The underside of the bed rest pad 1 can also include a rigid plate 6, preferably manufactured from plastic. The rigid plate 6 helps the channels maintain their shape as pressure is varied in the channels 2.

FIG. 2a depicts a side view of an alternative embodiment of the bed rest pad 1, wherein the thickness of the bed rest pad 1 is relatively uniform along the length of the pad. In addition, FIG. 2a depicts how such a pad would support a patient resting upon it. FIG. 2b depicts a bony projection 9, such as the scapula, sacrum or trochanter, pressing into the bed rest pad 1. The bony projection 9 causes a depression 10 in one of the fluid-filled channels 2 inside the bed rest pad 1, thus relieving the pressure on the skin surface of the patient.

The cross-sectional shape of the channels 2 can take a variety of forms. In one embodiment, depicted in FIG. 2c, the cross-section of the channels 2 is circular in shape. In another embodiment, depicted in FIGS. 2a, 4a, 6b, and [7a] 7b, the cross sectional shape of the channels 2 is elliptical. In a third embodiment of the channels, depicted in FIGS. 3a and 3b, the channels have a cup-shaped cross-section, with the cross-section being relatively flat at an upper channel wall 11 proximal to the upper surface 7 of the bed rest pad 1, and having a lower wall 12 of the channel 2 that is rounded or

the channel to completely relieve pressure on a patient's body.

The channels 2 can be filled with any of a variety of pneumatic fluid materials. A preferred pneumatic fluid material should be relatively incompressible, so that the application of pressure to the top of the channel causes the channel to change shape in a direction perpendicular to the direction of the pressure. Examples of preferred fluids include compressed air, water, and liquid silicone. The use of a semi-compressible core material 5 surrounding the channels 2 permits the channels 2 to alter shape in response to an applied pressure.

The open end of each channel 2 is connected via a flexible transfer tube 17, as shown in FIGS. 4b and 7b, to a fluid distributor 30, shown in FIG. 3c, which is connected in turn to a vacuum pump. Vacuum fluid pumps and distributors are well known in the art, and are available as an integrated unit. The fluid distributor 30 is designed to temporally vary the fluid pressure in the channels 2 by selectively pumping fluid into different channels 2 at different times. A schematic of the bed rest unit 1, the flexible transfer tubes 17, the fluid distributor 30, and vacuum pump 31 is depicted in FIG. 5. The fluid distributor 30 thus routinely and methodically varies the pressure on a bedridden patient's pelvis and thighs. The fluid distributor 30 can optionally include a micro-controller, which can be programmed to produce virtually any temporal pattern of fluid pressure change in the channels. Fluid distributors are also well known in the art. One exemplary temporal pressure action pattern is to have a pressure change move back and forth from top to bottom and back among the channels 2 in the bed rest pad 1. This

temporal pressure variation of the fluid filled channels 2 helps relieve pressure points on a patient's body, and thus helps to prevent bedsores. This pressure action can also aid in maintaining a patient's circulation. In addition, the pump 31 and distributor 30 can optionally include a heating unit with a temperature controller that enables a technician to control the temperature of the pneumatic fluid. FIG 7a depicts a schematic diagram of a bed rest pad 1 with an attached heater 32.

Another aspect of the invention is a patient anti-slide device 3, depicted in FIGS. 1a and 1b, intended for use with a bed frame that pivots to raise a patient from a prone position to a sitting or reclining position. This anti-slide device 3 is used in conjunction with the bed rest device 1 to prevent a patient who is sitting at least partially upright from sliding off of the bed rest device. As shown in FIG. 1b, the anti-slide device 3 is disposed underneath the bed rest device 3 but on top of a mattress 20. The anti-slide device 3 is also provided with a plurality of straps to hold the anti-slide device and the patient in place: (1) a longitudinal frame strap 21 to secure the anti-slide device 3 to a longitudinal portion of a bed frame 25; (2) a patient strap 22 to secure a patient to the bed rest device 1; and (3) a vertical frame strap 23 to secure the anti-slide device 3 to the portion of the bed frame 25 that has pivoted into a raised position. Thus, a patient can be raised by an angle of up to 45° without sliding off of the bed rest unit 1. In addition, even though a patient is strapped in place by the patient strap 22 of the anti-slide device 3, the dynamic pressure variance action of the bed rest unit 1 can help prevent the patient from developing bedsores.

Even though the bed rest pad of the invention has been described in terms of an embodiment supporting the pelvis and